

CLAIMS

1. An reduced-average-power electronic circuit comprising: a power source; a switch mode power supply (SMPS) powered by the power source, the SMPS having a capacity which is lower than the maximum power requirement for the hereafter-recited load; a load, powered by the SMPS, having a requirement for varying amounts of power, the power having low noise during high power conditions and the load tolerating a low voltage during low power conditions; and means for applying power from the power source to the load without passing through the SMPS when the applied power is higher than a threshold, the threshold being lower than or equal to the capacity of the SMPS.

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2. The electronic circuit of claim 1, wherein the power source comprises a battery.

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3. The electronic circuit of claim 1, wherein the load comprises a transceiver power amplifier.

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4. The electronic circuit of claim 1 wherein the means for applying power from the power source to the load without passing through the SMPS comprises a switch in parallel with the SMPS.

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5. The electronic circuit of claim 4, wherein the switch is coupled to a controller which is structured to close the switch when the applied power is higher than the threshold and to open the switch when the applied power is lower than the threshold.

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6. The electronic circuit of claim 5, wherein the controller further comprises a timer which is structured: to delay closing the switch, when the applied power is higher than the threshold, until a predetermined period of time has elapsed since the switch was last opened; or to delay opening the switch, when the applied power is lower than the threshold, until a predetermined period of time has elapsed since the switch was last closed; or both.
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7. The electronic circuit of claim 5, wherein the threshold comprises a first threshold and a second threshold which is lower than the first threshold, and wherein the controller is structured to open the switch when the applied power is lower than a second threshold, thereby introducing hysteresis between closing the switch at the higher first threshold and opening the switch at the lower second threshold.
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8. The electronic circuit of claim 7, wherein the controller further comprises a timer which is structured: to delay closing the switch, when the applied power is higher than the threshold, until a predetermined period of time has elapsed since the switch was last opened; or to delay opening the switch, when the applied power is lower than the threshold, until a predetermined period of time has elapsed since the switch was last closed; or both.
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9. A method for supplying a reduced average power to a load, comprising the steps of: powering a switch mode power supply (SMPS) with a power source; powering the load with the SMPS; and applying power from the power source to the load without passing through the SMPS when the applied power is higher than a threshold; wherein: the load has a requirement for varying amounts of power; the power source has low noise during high power conditions and the load tolerating a low voltage during low power conditions; the SMPS has a capacity which is lower than the maximum power requirement
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for the load; and the threshold is lower than or equal to the capacity of the SMPS.

10. The method of claim 9, wherein the power source comprises a battery.
- 5 11. The method of claim 9, wherein the load comprises a transceiver power amplifier.
12. The method of claim 9, wherein the step of applying power from the power source to the load without passing through the SMPS comprises the step of closing a switch in parallel with the SMPS.
- 10 13. The method of claim 12, wherein the step of closing the switch is preceded by the step of actuating a controller which is coupled to the switch, and which is actuated when the applied power is higher than the threshold.
- 15 14. The method of claim 13, further comprising the steps of: delaying closing the switch, when the applied power is higher than the threshold, until a predetermined period of time has elapsed since the switch was last opened; or delaying opening the switch, when the applied power is lower than the threshold, until a predetermined period of time has elapsed since the switch was last closed; or both.
- 20 15. The method of claim 12, wherein the threshold comprises a first threshold and a second threshold which is lower than the first threshold, and wherein the method further comprises the steps of: opening the switch when the applied power is lower than the second threshold; and closing the switch when the applied power is higher than the second threshold; thereby introducing

hysteresis between closing the switch at the higher first threshold and opening the switch at the lower second threshold.

- 5 16. The method of claim 15, further comprising the steps of: delaying closing the switch, when the applied power is higher than the threshold, until a predetermined period of time has elapsed since the switch was last opened; or delaying opening the switch, when the applied power is lower than the threshold, until a predetermined period of time has elapsed since the switch was last closed; or both.
- 10 17. Apparatus for supplying a reduced average power to a load, comprising: means for powering a switch mode power supply (SMPS) with a power source; means for powering the load with the SMPS; and means for applying power from the power source to the load without passing through the SMPS when the applied power is higher than a threshold; wherein: the load has a requirement for varying amounts of power; the load tolerates a low voltage during low power conditions; the power source has low noise during high power conditions; the SMPS has a capacity which is lower than the maximum power requirement for the load; and the threshold is lower than or equal to the capacity of the SMPS.
- 15 18. The apparatus of claim 17, wherein the power source comprises a battery.
- 20 19. The apparatus of claim 17, wherein the load comprises a transceiver power amplifier.
20. The apparatus of claim 17, wherein the means for applying power from the power source to the load without passing through the SMPS comprises means for closing a switch in parallel with the SMPS.

21. The apparatus of claim 20, wherein the means for closing the switch is coupled to preceding means for actuating a controller which is coupled to the switch, and which is actuated when the applied power is higher than the threshold.

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22. The apparatus of claim 21, further comprising: means for delaying closing the switch, when the applied power is higher than the threshold, until a predetermined period of time has elapsed since the switch was last opened; or means for delaying opening the switch, when the applied power is lower than the threshold, until a predetermined period of time has elapsed since the switch was last closed; or.

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23. The apparatus of claim 20, wherein the threshold comprises a first threshold and a second threshold which is lower than the first threshold, and wherein the apparatus further comprises: means for opening the switch when the applied power is lower than the second threshold; and means for closing the switch when the applied power is higher than the second threshold; thereby introducing hysteresis between closing the switch at the higher first threshold and opening the switch at the lower second threshold.

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24. The method of claim 23, further comprising: means for delaying closing the switch, when the applied power is higher than the threshold, until a predetermined period of time has elapsed since the switch was last opened; or means for delaying opening the switch, when the applied power is lower than the threshold, until a predetermined period of time has elapsed since the switch was last closed; or both.